that falls from the test specimen after the flame from the gas has been removed.

(8) Record the length of burned (charred) area of each test specimen measured longitudinally along the cable axis.

(9) Repeat the procedure for the remaining two specimens.

(b) *Acceptable performance.* Each of the three test specimens shall meet the following criteria:

(1) The duration of burning shall not exceed 60 seconds.

(2) The length of the burned (charred) area shall not exceed 6 inches.

§ 7.409 Approval marking.

Approved electric cables, signaling cables, and splices shall be legibly and permanently marked with the MSHA-assigned approval marking. For electric cables and signaling cables, the marking shall appear at intervals not exceeding 3 feet and shall include the MSHA-assigned approval number in addition to the number and size (gauge) of conductors and cable type. For cables containing electric conductors, the marking shall also include the voltage rating. For splices, the marking shall be placed on the jacket so that it will appear at least once on the assembled splice.

§ 7.410 Post-approval product audit.

Upon request by MSHA, but no more than once a year except for cause, the approval holder shall supply to MSHA for audit at no cost—

(a) 12 feet of an approved electric cable or approved signaling cable; or

(b) 3 splice kits of one approved splice kit design and 12 feet of MSHA-assigned cable that the splice kit is designed to repair.

§ 7.411 New technology.

MSHA may approve cable products or splice kits that incorporate technology for which the requirements of this subpart are not applicable if the Agency determines that they are as safe as those which meet the requirements of this subpart.

Subpart L—Refuge Alternatives

SOURCE: 74 FR 80694, Dec. 31, 2008, unless otherwise noted.

§ 7.501 Purpose and scope.

This subpart L establishes requirements for MSHA approval of refuge alternatives and components for use in underground coal mines. Refuge alternatives are intended to provide a life-sustaining environment for persons trapped underground when escape is impossible.

§ 7.502 Definitions.

The following definitions apply in this subpart:

Apparent temperature. A measure of relative discomfort due to the combined effects of air movement, heat, and humidity on the human body.

Breathable oxygen. Oxygen that is at least 99 percent pure with no harmful contaminants.

Flash fire. A fire that rapidly spreads through a diffuse fuel, such as airborne coal dust or methane, without producing damaging pressure.

Noncombustible material. Material, such as concrete or steel, that will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat.

Overpressure. The highest pressure over the background atmospheric pressure that could result from an explosion, which includes the impact of the pressure wave on an object.

Refuge alternative. A protected, secure space with an isolated atmosphere and integrated components that create a life-sustaining environment for persons trapped in an underground coal mine.

§ 7.503 Application requirements.

(a) An application for approval of a refuge alternative or component shall include:

(1) The refuge alternative's or component's make and model number, if applicable.

(2) A list of the refuge alternative's or component's parts that includes—

(i) The MSHA approval number for electric-powered equipment;

(ii) Each component's or part's in-mine shelf life, service life, and recommended replacement schedule;

(iii) Materials that have a potential to ignite used in each component or part with their MSHA approval number; and

(iv) A statement that the component or part is compatible with other components and, upon replacement, is equivalent to the original component or part.

(3) The capacity and duration (the number of persons it is designed to maintain and for how long) of the refuge alternative or component on a per-person per-hour basis.

(4) The length, width, and height of the space required for storage of each component.

(b) The application for approval of the refuge alternative shall include the following:

(1) A description of the breathable air component, including drawings, air-supply sources, piping, regulators, and controls.

(2) The maximum volume, excluding the airlock; the dimensions of floor space and volume provided for each person using the refuge alternative; and the floor space and volume of the airlock.

(3) The maximum positive pressures in the interior space and the airlock and a description of the means used to limit or control the positive pressure.

(4) The maximum allowable apparent temperature of the interior space and the airlock and the means to control the apparent temperature.

(5) The maximum mine air temperature under which the refuge alternative is designed to operate when the unit is fully occupied.

(6) Drawings that show the features of each component and contain sufficient information to document compliance with the technical requirements.

(7) A manual that contains sufficient detail for each refuge alternative or component addressing in-mine transportation, operation, and maintenance of the unit.

(8) A summary of the procedures for deploying refuge alternatives.

(9) A summary of the procedures for using the refuge alternative.

(10) The results of inspections, evaluations, calculations, and tests conducted under this subpart.

(c) The application for approval of the air-monitoring component shall specify the following:

(1) The operating range, type of sensor, gas or gases measured, and environmental limitations, including the cross-sensitivity to other gases, of each detector or device in the air-monitoring component.

(2) The procedure for operation of the individual devices so that they function as necessary to test gas concentrations over a 96-hour period.

(3) The procedures for monitoring and maintaining breathable air in the airlock, before and after purging.

(4) The instructions for determining the quality of the atmosphere in the airlock and refuge alternative interior and a means to maintain breathable air in the airlock.

(d) The application for approval of the harmful gas removal component shall specify the following:

(1) The volume of breathable air available for removing harmful gas both at start-up and while persons enter through the airlock.

(2) The maximum volume of each gas that the component is designed to remove on a per-person per-hour basis.

§ 7.504 Refuge alternatives and components; general requirements.

(a) *Refuge alternatives and components:* (1) Electrical components that are exposed to the mine atmosphere shall be approved as intrinsically safe for use. Electrical components located inside the refuge alternative shall be either approved as intrinsically safe or approved as permissible.

(2) Shall not produce continuous noise levels in excess of 85 dBA in the structure's interior.

(3) Shall not liberate harmful or irritating gases or particulates into the structure's interior or airlock.

(4) Shall be designed so that the refuge alternative can be safely moved with the use of appropriate devices such as tow bars.

(5) Shall be designed to withstand forces from collision of the refuge alternative structure during transport or handling.

(b) The apparent temperature in the structure shall be controlled as follows: